

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
22 February 2001 (22.02.2001)

PCT

(10) International Publication Number  
**WO 01/12819 A3**

(51) International Patent Classification<sup>7</sup>: **C12N 15/55**,  
9/16, C07K 16/40, C12Q 1/42, 1/68, A61K 38/46

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(21) International Application Number: PCT/US00/22158

(22) International Filing Date: 11 August 2000 (11.08.2000)

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/149,005 13 August 1999 (13.08.1999) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,  
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,  
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,  
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(63) Related by continuation (CON) or continuation-in-part  
(CIP) to earlier application:  
US 60/149,005 (CIP)  
Filed on 13 August 1999 (13.08.1999)

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW). Eurasian  
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM). European  
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,  
IT, LU, MC, NL, PT, SE). OAPI patent (BF, BJ, CF, CG,  
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Published:

— with international search report

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(88) Date of publication of the international search report:  
24 January 2002

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

WO 01/12819 A3

(54) Title: PROTEIN PHOSPHATASES AND DIAGNOSIS AND TREATMENT OF PHOSPHATASE-RELATED DISORDERS

(57) Abstract: The present invention concerns polypeptides, nucleic acids encoding such polypeptides, cells, tissues and animals containing such nucleic acids, antibodies to the polypeptides, assays utilizing the polypeptides, and methods relating to all of the foregoing. Preferably, the polypeptides of the present invention are phosphatases. Through the use of a "motif extraction" bioinformatics script, additional mammalian members of the phosphatase family are herein presented. These phosphatases include MKP-like proteins, a CDC14-like protein, a PTEN-like protein, and myotubularin (MTM)-like proteins. Classification of proteins as new members of established families has proven highly accurate not only in predicting motifs present in the remaining non-catalytic portion of each protein, but also in their regulation, substrates, and signaling pathways.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/55 C12N9/16 C07K16/40 C12Q1/42 C12Q1/68  
A61K38/46

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data, EMBL, EPO-Internal, WPI Data, BIOSIS, STRAND, MEDLINE, EMBASE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! Accession number AI021222, 18 June 1998 (1998-06-18) MARRA, M. ET AL.: " ub03e08.r1 Soares mouse mammary gland NbMMG Mus musculus cDNA clone IMAGE:1365926 5' similar to TR:P91585 P91585 COS41.7. ; mRNA sequence." XP002159207 abstract relevant to invention 1 --- -/--</p>	<p>1-12, 18-23</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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\*A\* document defining the general state of the art which is not considered to be of particular relevance

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

29 May 2001

Date of mailing of the international search report

27. 06. 01

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE SWALL 'Online!  Accession number 043183,  1 June 1998 (1998-06-01)  LI, L. ET AL.: "Tyrosine phosphatase  CDC14B"  XP002159208  abstract  relevant to invention 1  -&amp; LI, L. ET AL.: "A family of putative  tumor suppressors is structurally and  functionally conserved in humans and  yeast."  J. BIOL. CHEM,  vol. 272, no. 47,  21 November 1997 (1997-11-21), pages  29403-29406, XP002159206</p>	1-12, 18-23
X	<p>DATABASE SWALL 'Online!  Accession number P91585,  1 May 1997 (1997-05-01)  BIRD, A.P. ET AL.: "COS41.7 from Ciona  intestinalis; Tyr phosphatase"  XP002159209  the whole document  relevant to inventions 1, 20</p>	1-12, 18-23
X	<p>MUDA MARCO ET AL: "Molecular cloning and  functional characterization of a novel  mitogen-activated protein kinase  phosphatase, MKP-4"  JOURNAL OF BIOLOGICAL CHEMISTRY, THE  AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS,  INC., US,  vol. 272, no. 8, 1997, pages 5141-5151,  XP002144712  ISSN: 0021-9258  relevant to inventions 1, 6, 9, 10, 11,  12, 13, 14, 15, 16</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA023073,  10 August 1996 (1996-08-10)  MARRA, M. ET AL.: " mh66e03.r1 Soares  mouse placenta 4NbMP13.5 14.5 Mus musculus  cDNA clone"  XP002159242  the whole document  relevant to invention 1</p>	1-10

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AA028820,  17 August 1996 (1996-08-17)  MARRA, M. ET AL.: "mh87f02.r1 Soares mouse  placenta 4NbMP13.5 14.5 Mus musculus cDNA  clone IMAGE:457947 5', mRNA sequence."  XP002159243  the whole document  relevant to invention 1</p>	1-10
X	<p>DATABASE EMBL 'Online!  Accession number AA374753,  18 April 1997 (1997-04-18)  ADAMS, M.D. ET AL.: "EST86937 HSC172 cells  I Homo sapiens cDNA 5' end similar to  similar to tyrosine phosphatase CL100."  XP002167448  the whole document  relevant to invention 6</p>	1-12, 18-23
X	<p>-&amp; ADAMS, M.D. ET AL.: "Initial  assessment of human gene diversity and  expression patterns based upon 83 million  nucleotides of cDNA sequence"  NATURE,  vol. 377, 28 September 1995 (1995-09-28),  pages 3-174, XP002920293</p>	
X	<p>DATABASE EMBL 'Online!  Accession number AA411671,  4 May 1997 (1997-05-04)  HILLIER, L. ET AL.: "zv10h07.r1  Soares_NhHMPu_S1 Homo sapiens cDNA clone  IMAGE:753277 5' similar to TR:E218398  E218398 DUAL SPECIFICITY PHOSPHATASE,  mRNA sequence."  XP002167449  relevant to invention 6  the whole document</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA461185,  13 June 1997 (1997-06-13)  HILLIER, L. ET AL.: "zx70e02.s1  Soares_total_fetus_Nb2HF8_9w Homo sapiens  cDNA clone IMAGE:796826 3' similar to  WP:ZK757.2 CE00468 PROTEIN-TYROSINE  PHOSPHATASE ; mRNA sequence."  XP002167685  the whole document  relevant to invention 9  abstract</p>	1-12, 18-23

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AA774585,  6 February 1998 (1998-02-06)  STRAUSBERG, R.: "ai27e05.s1  Soares_testis_NHT Homo sapiens cDNA clone  1344032 3' similar to SW:DUS3_HUMAN P51452  DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 ;  mRNA sequence."  XP002168516  the whole document  relevant to invention 9</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA723271,  8 January 1998 (1998-01-08)  HILLIER, L. ET AL.: "zg88b02.s1  Soares_fetal_heart_NbHH19W Homo sapiens  cDNA clone IMAGE:409611 3' similar to  SW:DUS3_HUMAN P51452 DUAL SPECIFICITY  PROTEIN PHOSPHATASE 3 ; mRNA sequence."  XP002167684  the whole document  relevant to invention 9</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA813372,  16 February 1998 (1998-02-16)  STRAUSBERG, R.: "aj33b01.s1  Soares_testis_NHT Homo sapiens cDNA clone  1392073 3' similar to TR:Q93592 Q93592  F26A3.4. ; mRNA sequence."  XP002167608  the whole document  relevant to invention 10</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AI025489,  19 June 1998 (1998-06-19)  STRAUSBERG, R.: "ov67c10.x1  Soares_testis_NHT Homo sapiens cDNA clone  IMAGE:1642386 3' similar to WP:F26A3.4  CE09669 PROTEIN-TYROSINE PHOSPHATASE ;  mRNA sequence."  XP002167609  the whole document  relevant to invention 10</p> <p style="text-align: center;">---</p>	1-12, 18-23

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AI283262,  24 November 1998 (1998-11-24)  STRAUSBERG, R.: "qk50g08.x1 NCI_CGAP_Co8  Homo sapiens cDNA clone IMAGE:1872446 3'  similar to WP:F26A3.4 CE09669  PROTEIN-TYROSINE PHOSPHATASE ; mRNA  sequence."  XP002167450  the whole document  relevant to invention 11</p>	<p>1-12,  18-23</p>
X	<p>DATABASE EMBL 'Online!  Accession number AA915932,  16 April 1998 (1998-04-16)  STRAUSBERG, R.: " on18c06.s1 NCI_CGAP_Lu5  Homo sapiens cDNA clone IMAGE:1557034 3'  similar to TR:Q91790 Q91790 MAP KINASE  PHOSPHATASE ; mRNA sequence."  XP002167451  the whole document  relevant to invention 11</p>	<p>1-12,  18-23</p>
X	<p>DATABASE EMBL 'Online!  Accession number AC003072,  18 November 1997 (1997-11-18)  MURRAY, J. ET AL.: " Human BAC clone  CTA-963H5 from 22q12.1-qter, complete  sequence."  XP002167452  the whole document  relevant to invention 11</p>	<p>1-10</p>
X	<p>DATABASE EMBL 'Online!  Accession number AA147450,  14 December 1996 (1996-12-14)  HILLIER, L. ET AL.: "z151g08.r1  Soares_pregnant_uterus_NbHPU Homo sapiens  cDNA clone IMAGE:505502 5' similar to  SW:PVH1_YEAST Q02256 PROTEIN-TYROSINE  PHOSPHATASE YVH1 ; mRNA sequence."  XP002167453  the whole document  relevant to invention 12</p>	<p>1-12,  18-23</p>

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AA489562,  2 July 1997 (1997-07-02)  HILLIER, L. ET AL.: "ab40g09.r1 Stratagene  HeLa cell s3 937216 Homo sapiens cDNA  clone IMAGE:843328 5' similar to  SW:PVH1_YEAST Q02256 PROTEIN-TYROSINE  PHOSPHATASE YVH1 ; mRNA sequence."  XP002167454  the whole document  relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA314946,  18 April 1997 (1997-04-18)  ADAMS, M.D. ET AL.: "EST186775 HCC cell  line (matatasis to liver in mouse) II  Homo sapiens cDNA 5' end similar to  similar to tyrosine phosphatase CL100."  XP002167455  the whole document  relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AI264834,  16 November 1998 (1998-11-16)  STRAUSBERG, R.: "qx66f03.x1 NCI_CGAP_Ov36  Homo sapiens cDNA clone IMAGE:2006333 3'  similar to TR:Q91790 Q91790 MAP KINASE  PHOSPHATASE ; mRNA sequence."  XP002167456  the whole document  relevant to invention 13</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AI672432,  19 May 1999 (1999-05-19)  STRAUSBERG, R.: "wa03b04.x1 NCI_CGAP_Kid11  Homo sapiens cDNA clone IMAGE:2296975 3'  similar to TR:Q29449 Q29449 CHROMAFFIN  GRANULE ATPASE II. ; mRNA sequence."  XP002167457  the whole document  relevant to invention 13</p> <p style="text-align: center;">---</p>	1-10
X	<p>DATABASE EMBL 'Online!  Accession number AI018628,  18 June 1998 (1998-06-18)  STRAUSBERG, R.: "ou47g09.x1 NCI_CGAP_Br2  Homo sapiens cDNA clone IMAGE:1631008 3'  similar to TR:Q29449 Q29449 CHROMAFFIN  GRANULE ATPASE II. ; mRNA sequence."  XP002167458  the whole document  relevant to invention 13</p> <p style="text-align: center;">---</p>	1-10

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AI025365,  19 June 1998 (1998-06-19)  STRAUSBERG, R.: "ow27b10.s1  Soares_parathyroid_tumor_NbHPA Homo  sapiens cDNA clone IMAGE:1648027 3'  similar to SW:DUS5_HUMAN Q16690 DUAL  SPECIFICITY PROTEIN PHOSPHATASE 5 ; mRNA  sequence."  XP002167610  the whole document  relevant to invention 14</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AI394036,  5 February 1999 (1999-02-05)  STRAUSBERG, R.: "tg11g09.x1 NCI_CGAP_CLL1  Homo sapiens cDNA clone IMAGE:2108512 3'  similar to SW:DUS5_HUMAN Q16690 DUAL  SPECIFICITY PROTEIN PHOSPHATASE 5 ; mRNA  sequence."  XP002167611  the whole document  relevant to invention 14</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AI031656,  24 June 1998 (1998-06-24)  "ow48e06.x1  Soares_parathyroid_tumor_NbHPA Homo  sapiens cDNA clone IMAGE:1650082 3'  similar to SW:PTP3_CHLEU Q39491 PUTATIVE  PROTEIN TYROSINE PHOSPHATASE ; mRNA  sequence."  XP002167612  the whole document  relevant to invention 14</p>	1-12, 18-23
A	<p>-&amp; DATABASE SWALL 'Online!  Accession number Q39491,  1 November 1997 (1997-11-01)  HARING, M.A. ET AL.: "DUAL SPECIFICITY  PROTEIN PHOSPHATASE (EC 3.1.3.48) (EC  3.1.3.16)"  XP002167613  the whole document</p>	

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**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TANOUE TAKUJI ET AL: "Molecular cloning and characterization of a novel dual specificity phosphatase, MKP-5" JOURNAL OF BIOLOGICAL CHEMISTRY, AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, BALTIMORE, MD, US, vol. 274, no. 28, 9 July 1999 (1999-07-09), pages 19949-19956, XP002148678 ISSN: 0021-9258 the whole document relevant to invention 15	1-12, 18-23
X	-& DATABASE EMBL 'Online! Accession number AB026436, 28 June 1999 (1999-06-28) TANOUE, T. ET AL.: "Homo sapiens mRNA for dual specificity phosphatase MKP-5, complete cds." XP002167549 the whole document	1-12, 18-23
X	--- DATABASE EMBL 'Online! Accession number AQ605319, 18 June 1999 (1999-06-18) MAHAIRAS, G.G. ET AL.: "HS_2119_B1_F10_MR CIT Approved Human Genomic Sperm Library D Homo sapiens genomic clone Plate=2119 Col=19 Row=L, genomic survey sequence." XP002167746 the whole document relevant to invention 16	1-10
X	--- DATABASE EMBL 'Online! Accession number AA322634, 18 April 1997 (1997-04-18) ADAMS, M.D. ET AL.: " EST25309 Cerebellum II Homo sapiens cDNA 5' end." XP002167747 the whole document relevant to invention 16	1-10
X	--- DATABASE EMBL 'Online! Accession number AA232384, 5 March 1997 (1997-03-05) HILLIER, L. ET AL.: "zr27d12.r1 Stratagene NT2 neuronal precursor 937230 Homo sapiens cDNA clone IMAGE:664631 5' similar to SW:YJ80_YEAST P47147 HYPOTHETICAL 80.2 KD PROTEIN IN CPA2-ATP2 INTERGENIC REGION. ; mRNA sequence." XP002167550 the whole document relevant to invention 17	1-12, 18-23

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number AI218964,  28 October 1998 (1998-10-28)  STRAUSBERG, R.: "qg72h10.x1  Soares_NFL_T_GBC_S1 Homo sapiens cDNA  clone IMAGE:1840771 3', mRNA sequence."  XP002167551  the whole document  relevant to invention 17</p> <p style="text-align: center;">---</p>	1-10
X	<p>DATABASE EMBL 'Online!  Accession number AA336212,  31 December 1998 (1998-12-31)  STRAUSBERG, R.: "qt44f08.x1  Soares_fetal_lung_NbHL19W Homo sapiens  cDNA clone IMAGE:1950855 3', mRNA  sequence."  XP002167552  the whole document  relevant to invention 17</p> <p style="text-align: center;">---</p>	1-10
X	<p>LAPORTE JOCELYN ET AL: "Characterization  of the myotubularin dual specificity  phosphatase gene family from yeast to  human."  HUMAN MOLECULAR GENETICS,  vol. 7, no. 11, October 1998 (1998-10),  pages 1703-1712, XP001000442  ISSN: 0964-6906  the whole document  relevant to inventions 17, 18</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AF073482,  17 November 1998 (1998-11-17)  LAPORTE, J. ET AL.: "Homo sapiens  myotubularin related protein 7 mRNA,  partial cds."  XP002167553  the whole document  relevant to invention 18</p> <p style="text-align: center;">---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AA663875,  14 November 1997 (1997-11-14)  HILLIER, L. ET AL.: "ae74a06.s1 Stratagene  schizo brain S11 Homo sapiens cDNA clone  IMAGE:969874 3', mRNA sequence."  XP002167554  the whole document  relevant to invention 18</p> <p style="text-align: center;">---</p>	1-10

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  Accession number Z98749,  22 August 1997 (1997-08-22)  LLOYD, D.: "Human DNA sequence from clone  RP3-449017 on chromosome 22q13.1-13.2  Contains the 3' part of the gene for a  novel protein similar to TPTE  (transmembrane phosphatase with tensin  homology), ESTs and GSSs."  XP002167614  the whole document  relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>DATABASE SWALL 'Online!  Accession number P56180,  15 July 1999 (1999-07-15)  CHEN, H. ET AL.: "Putative  protein-tyrosine phosphatase TPTE (EC  3.1.3.48)."  XP002167615  the whole document  relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>DATABASE EMBL 'Online!  Accession number AF007118,  9 September 1998 (1998-09-09)  CHEN, H. ET AL.: "Homo sapiens putative  tyrosine phosphatase mRNA, complete cds."  XP002167616  the whole document  relevant to invention 19</p> <p>---</p>	1-12, 18-23
X	<p>CHEN HAIMING ET AL.: "Chromosome 21cen  contains a testis-expressed gene encoding  a protein with transmembrane, tyrosine  phosphatase, and tensin domains and has  homologous copies on chromosomes 13, 15,  22 and Y."  AMERICAN JOURNAL OF HUMAN GENETICS,  vol. 61, no. 4 SUPPL.,  October 1997 (1997-10), page A168  XP001000400  47th Annual Meeting of the American  Society of Human Genetics; Baltimore,  Maryland, USA; October 28-November 1, 1997  ISSN: 0002-9297  the whole document  relevant to invention 19</p> <p>---</p> <p style="text-align: center;">-/--</p>	1-12, 18-23

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 'Online! Accession number AI816223, 12 July 1999 (1999-07-12) HILLIER, L. ET AL.: "au45g10.y1 Schneider fetal brain 00004 Homo sapiens cDNA clone; IMAGE:2517762 5' similar to TR:P91585 P91585 COS41.7. mRNA sequence." XP002167459 the whole document relevant to invention 20 ---	1-12, 18-23
A	WO 99 02704 A (MYERS MICHAEL P ;COLD SPRING HARBOR LAB (US); TONKS NICHOLAS K (US) 21 January 1999 (1999-01-21) the whole document relevant to inventions 1, 6 ---	
A	DATABASE SWALL 'Online! Accession number P51452, 1 October 1996 (1996-10-01) ISHIBASHI, T. ET AL.: "DUAL SPECIFICITY PROTEIN PHOSPHATASE 3 (EC 3.1.3.48) (EC 3.1.3.16)" XP002167686 the whole document relevant to invention 9 ---	
A	DATABASE SWALL 'Online! Accession number 095147, 1 May 1999 (1999-05-01) YUAN, Y. ET AL.: "MKP-1 LIKE PROTEIN TYROSINE PHOSPHATASE (EC 3.1.3.48) (MAP KINASE PHOSPHATASE 6)." XP002167617 the whole document relevant to invention 10 ---	
A	DATABASE SWALL 'Online! Accession number Q93592, 1 February 1997 (1997-02-01) WILSON, R. ET AL.: "F26A3.4 Protein (EC 3.1.3.48)" XP002167618 the whole document relevant to invention 10 ---	

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>KEYSE S M: "AN EMERGING FAMILY OF DUAL SPECIFICITY MAP KINASE PHOSPHATASES" BIOCHIMICA ET BIOPHYSICA ACTA. MOLECULAR CELL RESEARCH,NL,ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, vol. 1265, 1995, pages 152-160, XP000196716 ISSN: 0167-4889 the whole document relevant to inventions 6, 9, 10, 11, 12, 13, 14, 15, 16</p> <p style="text-align: center;">---</p>	
A	<p>GUAN K ET AL: "The yeast open reading frame encoding a dual specificity phosphatase" TIBS TRENDS IN BIOCHEMICAL SCIENCES,ELSEVIER PUBLICATION, CAMBRIDGE,EN, vol. 18, no. 1, January 1993 (1993-01), page 6 XP002145709 ISSN: 0968-0004 the whole document relevant to invention 12</p> <p style="text-align: center;">---</p>	
A	<p>DATABASE EMBL 'Online! Accession number AF038844, 6 January 1999 (1999-01-06) YUAN Y. ET AL.: "Homo sapiens MKP-1 like protein tyrosine phosphatase mRNA, complete cds." XP002167460 the whole document relevant to invention 13</p> <p style="text-align: center;">---</p>	
A	<p>GUPTA RAJEEV ET AL: "Identification of a dual-specificity protein phosphatase that inactivates a MAP kinase from Arabidopsis." PLANT JOURNAL, vol. 16, no. 5, December 1998 (1998-12), pages 581-589, XP002167745 ISSN: 0960-7412 the whole document relevant to inventions 14, 16</p>	
A	<p>-&amp; DATABASE SWALL 'Online! Accession number Q9ZR37, 1 May 1999 (1999-05-01) GUPTA, R. ET AL.: "DSPTP1 PROTEIN" XP002167794 the whole document</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	

## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	<p>DATABASE SWISS PROT 'Online!  Accession number P47147,  1 February 1996 (1996-02-01)  RAMEZANI RAD, M. ET AL.: "HYPOTHETICAL  80.2 KDA PROTEIN IN CPA2-NNF1 INTERGENIC  REGION."  XP002167555  the whole document  relevant to invention 17  ---</p>	
A	<p>DATABASE SWALL 'Online!  Q13613, 1 November 1997 (1997-11-01)  KIOSCHIS, P. ET AL.: "MYOTUBULARIN-RELATED  PROTEIN 1 (FRAGMENT)."  XP002167556  the whole document  relevant to invention 17  ---</p>	
P,X	<p>DATABASE EMBL 'Online!  Accession number AW258860,  26 December 1999 (1999-12-26)  MARRA, M. ET AL.: "um74f03.y1 Sugano mouse  kidney mkia Mus musculus cDNA clone  IMAGE:2300957 5' similar to TR:P91585  COS41.7; mRNA sequence"  XP002159210  abstract  relevant to invention 1  ---</p>	1-12, 18-23
P,X	<p>WO 00 06728 A (INCYTE PHARMA INC  ;PATTERSON CHANDRA (US); AZIMZAI YALDA  (US); COR) 10 February 2000 (2000-02-10)  see SEQ ID NO: 27, SEQ ID NO: 58 for  invention 6 and SEQ ID NO: 11, SEQ ID NO:  42 for invention 9  relevant to inventions 6, 9  ---</p>	1-12, 18-23
P,X	<p>WO 00 18890 A (ACTON SUSAN ;MILLENNIUM  PHARM INC (US)) 6 April 2000 (2000-04-06)  see SEQ ID NO: 11, SEQ ID NO: 12  relevant to invention 9  ---</p>	1-12, 18-23
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# INTERNATIONAL SEARCH REPORT

International Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	NAKAMURA KOJI ET AL: "Molecular cloning and characterization of a novel dual-specificity protein phosphatase possibly involved in spermatogenesis" BIOCHEMICAL JOURNAL, THE BIOCHEMICAL SOCIETY, LONDON, GB, vol. 344, no. 3, 15 December 1999 (1999-12-15), pages 819-825, XP002144926 ISSN: 0264-6021 the whole document relevant to invention 9	1-12, 18-23
P,X	-& DATABASE SWALL 'Online! Accession number Q9UII6, 1 May 2000 (2000-05-01) NAKAMURA, K. ET AL.: "PROTEIN PHOSPHATASE" XP002167687 the whole document	1-12, 18-23
P,X	-& DATABASE EMBL 'Online! Accession number AB027004, 14 January 2000 (2000-01-14) NAKAMURA, K. ET AL.: "Homo sapiens mRNA for protein phosphatase, complete cds." XP002167688 the whole document	1-12, 18-23
P,X	--- DATABASE EMBL 'Online! Accession number AL133545, 16 December 1999 (1999-12-16) HOWDEN P.: "Human DNA sequence from clone RP11-386N14 on chromosome Xp11.23-11.4. Contains ESTs, STSs, GSSs and CpG islands. Contains a gene for a novel protein similat to a dual specifity phosphatase..." XP002167620 the whole document relevant to invention 10 --- -/--	1-12, 18-23

# INTERNATIONAL SEARCH REPORT

In. ation Application No

PCT/US 00/22158

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>DATABASE EMBL 'Online!  Accession number AF119226,  25 August 1999 (1999-08-25)  MUDA, M. ET AL.: "Homo sapiens  dual-specificity tyrosine phosphatase YVH1  mRNA, complete cds."  XP002167462  the whole document  -&amp; MUDA MARCO ET AL: "Identification of  the human YVH1 protein-tyrosine  phosphatase orthologue reveals a novel  zinc binding domain essential for in vivo  function"  JOURNAL OF BIOLOGICAL CHEMISTRY, THE  AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS,  INC., US,  vol. 274, no. 34,  20 August 1999 (1999-08-20), pages  23991-23995, XP002145708  ISSN: 0021-9258  the whole document  relevant to invention 12</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>DATABASE EMBL 'Online!  Accession number AW772145,  5 May 2000 (2000-05-05)  STRAUSBERG, R.: "hn68c07.x1 NCI_CGAP_Kid11  Homo sapiens cDNA clone IMAGE:3033036 3'  similar to TR:095147 095147 MKP-1 LIKE  PROTEIN TYROSINE PHOSPHATASE ; mRNA  sequence."  XP002167461  the whole document  relevant to invention 13</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>THEODOSIOU A ET AL: "MKP5, A NEW MEMBER  OF THE MAP KINASE PHOSPHATASE FAMILY,  WHICH SELECTIVELY DEPHOSPHORYLATES  STRESS-ACTIVATED KINASES"  ONCOGENE, BASINGSTOKE, HANTS, GB,  vol. 18, no. 50,  25 November 1999 (1999-11-25), pages  6981-6988, XP000946628  ISSN: 0950-9232  the whole document  relevant to invention 15</p> <p style="text-align: center;">---</p>	1-12, 18-23
P,X	<p>-&amp; DATABASE EMBL 'Online!  Accession number AF179212,  1 September 1999 (1999-09-01)  THEODOSIOU, A. ET AL.: " Homo sapiens dual  specificity phosphatase MKP5 (MKP5) mRNA,  complete cds."  XP002167812  the whole document</p> <p style="text-align: center;">---</p>	1-12, 18-23

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# INTERNATIONAL SEARCH REPORT

In .ational Application No

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>DATABASE EMBL 'Online!  Accession number AW732634,  26 April 2000 (2000-04-26)  STRAUSBERG, R.: "bb09h04.y1 NIH_MGC_14  Homo sapiens cDNA clone IMAGE:2958967 5'  similar to TR:Q9ZR37 Q9ZR37 DSPTP1  PROTEIN. ;contains Alu repetitive  element;; mRNA sequence."  XP002167748  the whole document  relevant to invention 16</p> <p style="text-align: center;">---</p>	<p>1-12,  18-23</p>
P,X	<p>DATABASE EMBL 'Online!  Accession number AK000449,  22 February 2000 (2000-02-22)  SUGANO, S. ET AL.: " Homo sapiens cDNA  FLJ20442 fis, clone KAT04828"  XP002167463  the whole document  relevant to invention 20</p> <p style="text-align: center;">---</p>	<p>1-10</p>
P,X	<p>DATABASE EMBL 'Online!  Accession number AK001790,  22 February 2000 (2000-02-22)  ISOGAI, T. ET AL.: "Homo sapiens cDNA  FLJ10928 fis, clone OVARC1000473, weakly  similar to DUAL SPECIFICITY PROTEIN  PHOSPHATASE 3 (EC 3.1.3.48) (EC  3.1.3.16)."  XP002167749  the whole document  relevant to invention 16</p> <p style="text-align: center;">---</p>	<p>1-12,  18-23</p>
P,X	<p>CHEN HAIMING ET AL: "A testis-specific  gene, TPTE, encodes a putative  transmembrane tyrosine phosphatase and  maps to the pericentromeric region of  human chromosomes 21 and 13, and to  chromosomes 15, 22, and Y."  HUMAN GENETICS,  vol. 105, no. 5, November 1999 (1999-11),  pages 399-409, XP001000438  ISSN: 0340-6717  the whole document  relevant to invention 19</p> <p style="text-align: center;">---</p>	<p>1-12,  18-23</p>

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## INTERNATIONAL SEARCH REPORT

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	CAMPS MONTSERRAT ET AL: "Dual specificity phosphatases: A gene family for control of MAP kinase function" FASEB JOURNAL, FED. OF AMERICAN SOC. FOR EXPERIMENTAL BIOLOGY, BETHESDA, MD, US, vol. 14, no. 1, January 2000 (2000-01), pages 6-16, XP002160024 ISSN: 0892-6638 the whole document relevant to inventions 6, 9-16 ---	1-12, 18-23
E	WO 01 05983 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 25 January 2001 (2001-01-25) see SEQ ID NO:2, SEQ ID NO:13, SEQ ID NO:22 relevant to inventions 1, 20 ---	1-12, 18-23
E	WO 01 02581 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 11 January 2001 (2001-01-11) see SEQ ID NO:1, SEQ ID NO:2 relevant to invention 6 ---	
E	WO 01 02582 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 11 January 2001 (2001-01-11) see SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 25 relevant to invention 6 ---	1-12, 18-23
E	WO 00 60098 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 12 October 2000 (2000-10-12) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 9 ---	1-12, 18-23
E	WO 00 63393 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 26 October 2000 (2000-10-26) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 10 ---	1-12, 18-23
E	WO 00 56899 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 28 September 2000 (2000-09-28) see SEQ ID NO: 1 relevant to invention 11 ---	1-12, 18-23
E	WO 00 65069 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 2 November 2000 (2000-11-02) see SEQ ID NO: 1, SEQ ID NO: 3 relevant to invention 12 ---	1-12, 18-23
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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/22158

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 00 60099 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 12 October 2000 (2000-10-12) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 14 ---	1-12, 18-23
E	WO 00 55332 A (INCYTE PHARMA INC ;AZIMZAI YALDA (US); YUE HENRY (US); AU YOUNG JA) 21 September 2000 (2000-09-21) see SEQ ID NO: 1, SEQ ID NO: 15 relevant to invention 15 ---	1-12, 18-23
E	WO 00 65068 A (CEPTYR INC ;LUCHE RALF M (US); WEI BO (US)) 2 November 2000 (2000-11-02) see SEQ ID NO: 1, SEQ ID NO: 2 relevant to invention 15 ---	1-12, 18-23
E	WO 01 20004 A (INCYTE GENOMICS INC ;AZIMZAI YALDA (US); YUE HENRY (US); BANDMAN O) 22 March 2001 (2001-03-22) the whole document relevant to inventions 16, 20 -----	1-12, 18-23

# INTERNATIONAL SEARCH REPORT

International application No.  
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## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 13-17  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
inventions 1, 6, 9-20
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 13-17

Present claims 13-17 relate to the use of a substance defined by reference to a desirable characteristic or property, namely the ability to modulate the activity of a phosphatase.

The claims cover all methods for treating a disease or disorder involving the use of a substance having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for none of such methods or substances. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the method by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:2 and subject-matter relating thereto.

2. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:4 and subject-matter relating thereto.

3. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:6 and subject-matter relating thereto.

4. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:8 and subject-matter relating thereto.

5. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:10 and subject-matter relating thereto.

6. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:12 and subject-matter relating thereto.

7. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:14 and subject-matter relating thereto.

8. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

sequence set forth in SEQ ID NO:16 and subject-matter relating thereto.

9. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:18 and subject-matter relating thereto.

10. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:20 and subject-matter relating thereto.

11. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:22 and subject-matter relating thereto.

12. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:24 and subject-matter relating thereto.

13. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:26 and subject-matter relating thereto.

14. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:28 and subject-matter relating thereto.

15. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:30 and subject-matter relating thereto.

16. Claims: 1-12, 18-23 (all partially)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:32 and subject-matter relating thereto.

17. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:34 and subject-matter relating thereto.

18. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:38 and subject-matter relating thereto.

19. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:40 and subject-matter relating thereto.

20. Claims: 1-12, 18-23 (all partially)

A nucleic acid encoding a polypeptide having the amino acid sequence set forth in SEQ ID NO:42 and subject-matter relating thereto.



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9902704 A	21-01-1999	AU 8479498 A	08-02-1999
WO 0006728 A	10-02-2000	AU 5134999 A EP 1100904 A	21-02-2000 23-05-2001
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